



# DATA VALIDATION REPORT

Gold King Mine Release Incident

SAMPLE DELIVERY GROUP: 680-119585-1

Prepared by

MEC^X  
12269 East Vassar Drive  
Aurora, CO 80014



## I. INTRODUCTION

Task Order Title: Gold King Mine Release Incident  
Project No.: 20408.012.001.0274.00  
Sample Delivery Group: 680-119585-1  
EPA Project Manager: Steve Way  
Weston Project Manager: Dave Robinson  
TDD No.: 0001/1508-04  
Matrix: Water  
QC Level: Stage 2A  
No. of Samples: 5  
No. of Reanalyses/Dilutions: 0  
Laboratory: TestAmerica- Savannah

**Table 1. Sample Identification**

<i>Location ID</i>	<i>Lab Sample Name</i>	<i>Matrix Type</i>	<i>Collection Date</i>	<i>Method</i>
A72_12012015	680-119585-4	Water	12/1/15 3:45 PM	200.7, 200.8, 2320B, 300.0, 4500
GKMTW908A_12022015	680-119585-5	Water	12/2/15 9:00 AM	200.7, 200.8, 2320B, 300.0, 4500
GSTO_F_12012015	680-119585-1	Water	12/1/15 2:10 PM	200.7, 200.8, 2320B, 300.0, 4500
GTSO_C_12012015	680-119585-2	Water	12/1/15 2:20 PM	200.7, 200.8, 2320B, 300.0, 4500
GTSO_C_12012015D	680-119585-3	Water	12/1/15 2:25 PM	200.7, 200.8, 2320B, 300.0, 4500

## II. Sample Management

Anomalies regarding sample management are noted below. The samples were received marginally below the temperature limits of  $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$  at  $1.4^{\circ}\text{C}$ . As none of the samples were noted to be frozen or damaged, no qualifications were applied. The samples were received intact, on ice, and properly preserved. The chains-of-custody (COCs) were appropriately signed and dated by field and laboratory personnel. The presence or absence of custody seals on the cooler was not specifically noted.

The following issues were noted:

- The COCs did not list CLP sample IDs, and none were provided. The laboratory logged the samples per the location IDs on the COCs.
- The presence or absence of sample tags was not noted in the case narrative, and sample tags were not listed on the COCs.

**Data Qualifier Reference Table**

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. The associated value is the quantitation limit or the estimated detection limit for dioxins or PCB congeners.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. The associated value is the sample detection limit or the quantitation limit for perchlorate only.
UB	The analyte was detected in the sample and in either the associated laboratory blank or field blank. If detected below the reporting limit (RL) the analyte result was reported as non-detected at the RL due to blank contamination. If detected above the RL, the analyte result was reported as non-detected at the reported result due to blank contamination.	The analyte was detected in the sample and in either the associated laboratory blank or field blank. If detected below the reporting limit (RL) the analyte result was reported as non-detected at the RL due to blank contamination. If detected above the RL, the analyte result was reported as non-detected at the reported result due to blank contamination.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+	Not applicable	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample, and may have a potential positive bias.
J-	Not applicable	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample, and may have a potential negative bias.



Qualifier	Organics	Inorganics
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
UJB	The analyte was detected in the sample and in either the associated laboratory blank or field blank; the analyte result was reported as non-detected at either the RL or the reported result. The reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The analyte was detected in the sample and in either the associated laboratory blank or field blank; the analyte result was reported as non-detected at either the RL or the reported result. The reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.

**Qualification Code Reference Table**

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D was noncompliant.	Correlation coefficient is <0.995 or calibration was noncompliant.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination as indicated by the preparation (method) blank results.	Presumed contamination as indicated by the preparation (method) or calibration blank results.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
L1	LCS/LCSD RPD was outside control limits.	LCS/LCSD RPD was outside control limits.
Q	MS/MSD recovery was poor.	MS recovery was poor.
Q1	MS/MSD RPD was outside control limits.	MS/MSD RPD was outside control limits.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	ICPMS tune was not compliant.
T	Presumed contamination as indicated by the trip blank results.	Not applicable.
+	False positive – reported compound was not present.	Not applicable.
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination as indicated by the FB or ER results.	Presumed contamination as indicated by the FB or ER results.
F1	Field duplicate results were outside the control limit.	Field duplicate results were outside the control limit.
\$	Reported result or other information was incorrect.	Reported result or other information was incorrect.



Qualifier	Organics	Inorganics
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
*II, *III	Unusual problems found with the data that have been described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Unusual problems found with the data that have been described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.



### III. Method Analyses

#### A. Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, 200.7, 200.8—Metals

Reviewed By: E. Wessling

Date Reviewed: December 8, 2015

The samples listed in Table 1 for these analyses were validated based on the guidelines outlined in the *Quality Assurance Project Plan for U.S. EPA Region 8 CERCLA Site Assessment, Sampling and Analysis Plan/Quality Assurance Project Plan for Gold King Mine Release, Silverton, San Juan County, Colorado* (2015), *United States Environmental Protection Agency Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, EPA Methods 200.7, 200.8* and the *National Functional Guidelines for Inorganic Superfund Data Review* (2010).

- Holding Times: The analytical holding time, six months for metals, was met.
- Analytical Method Blanks: The results listed in the table below were qualified estimated with a potential high bias (J+). There were no other detects reported in the method blanks.

Analyte	Method Blank (µg/L)	Qualified Samples
Vanadium	0.364	A74_12012015, GTSO_C_12012015D

- Laboratory Control Samples (LCS): The recoveries were within laboratory control limits of 85-115%.
- Laboratory Duplicates: No laboratory duplicate analyses were performed on a sample in this SDG. Method precision was evaluated based on matrix spike/matrix spike duplicate results.
- Matrix Spike/Matrix Spike Duplicate (MS/MSD): MS/MSD analyses were performed on the sample below.

Parent Sample	Analysis
GTSO_C_12012015	200.7 total, 200.8 total

Results were not assessed when the native concentration was more than 4× the spike amount. Potassium (total) was recovered above the limits in the MSD; therefore potassium (total) was qualified as estimated (J) in the site samples except for GKMTW908A\_12022015. The remaining recoveries were within the laboratory control limits of 75-125% for the 200.7 analytes and within 70-130% for the 200.8 analytes. The RPDs were ≤20%.

- Post Digestion Spike (PDS): There were no PDS analyses performed on a sample in this SDG.
- Serial Dilution: There were no serial dilution analyses performed in this SDG.
- Field QC Samples: Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. Following are findings associated with field QC samples:



- Field Blanks and Equipment Rinsates: No field blank or equipment rinsate samples were identified in this SDG.
- Field Duplicates: Samples GTSO\_C\_12012015 and GTSO\_C\_12012015D were identified as field duplicate samples. The RPD for dissolved aluminum and dissolved copper exceeded the control limit at 38% and 54% respectively. These elements were qualified as estimated (J) for the RPD outlier. The RPDs for the remaining analytes detected above the RL were within the reasonable control limit of  $\leq 30\%$  and the results for analytes detected below the RL were within  $\pm RL$ .

## B. VARIOUS EPA METHODS—General Chemistry

Reviewed By: E. Wessling

Date Reviewed: December 8, 2015

The samples listed in Table 1 for these analyses were validated based on the guidelines outlined in the *Quality Assurance Project Plan for U.S. EPA Region 8 CERCLA Site Assessment, Sampling and Analysis Plan/Quality Assurance Project Plan for Gold King Mine Release, Silverton, San Juan County, Colorado* (2015), *United States Environmental Protection Agency Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, EPA Method 300.0, Standard Methods for the Examination of Water and Wastewater 2320B and 4500 H+* and the *National Functional Guidelines for Superfund Inorganic Data Review* (2010).

- Holding Times: The pH measurements were performed in a fixed laboratory rather than on-site; therefore all pH results were qualified as estimated (J), as the analysis was not conducted in the field. No bias was assigned as the effect on the pH result could not be ascertained. The remaining holding times, as listed below, were met.
  - Alkalinity (2320B) – 14 days
  - Nitrate-N (300.0) - 24 hours
  - Remaining anions (300.0) – 28 days
  - pH (4500 H+) – ASAP
- Analytical Method Blanks: There were no detects in the method blanks.
- Laboratory Control Samples: The analytes utilized in the calculation of hardness were recovered within the metals control limits. The pH recovery was within the laboratory control limits of 63-158% but exceeded the EPA Method 150.1 check standard control limit of  $\pm 0.05$  at +0.18 pH units; therefore, the pH results in all samples were qualified as estimated with a potential high bias (J+). Alkalinity recoveries were within the laboratory control limits of 80-120%, anion recoveries were within the laboratory control limits of 90-110%, and alkalinity and anion RPDs were within the QAPP control limit of  $\leq 20\%$ .
- Laboratory Duplicates: Laboratory duplicate analyses were performed on the samples below.

Parent Sample	Analysis
GSTO_F_12012015	Chloride, fluoride, sulfate, alkalinity, pH



The pH RPD was within the laboratory control limit of  $\leq 40\%$  and within the EPA Method 150.1 control limit of  $\pm 0.05$  pH units. The RPDs for the remaining analytes were within the QAPP control limit of  $\leq 20\%$ .

- Matrix Spike/Matrix Spike Duplicate (MS/MSD): MS/MSD analyses are applicable only to the anion analysis. MS/MSD analyses were performed on the samples below.

Parent Sample	Analysis
GSTO_F_12012015	Chloride, fluoride, sulfate

Results were not assessed when the native concentration was more than 4× the spike amount. Recoveries were within the laboratory control limits of 80-120% and RPDs were within the QAPP control limit of  $\leq 20\%$ .

- Field QC Samples: Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. Following are findings associated with field QC samples:
  - Field Blanks and Equipment Rinsates: This SDG had no identified field blank or equipment rinsate samples.
  - Field Duplicates: Samples GSTO\_C\_12012015 and GSTO\_C\_12012015D were identified as field duplicate samples. The pH results were within the EPA Method 150.1 control limit of  $\pm 0.05$  pH units. The RPDs for the analytes detected above the RL were within the reasonable control limit of  $\leq 30\%$  and the results for analytes detected below the RL were within  $\pm RL$ .

# Validated Sample Result Forms: 680-119585-1

*Analysis Method*     200.7 Rev 4.4

**Sample Name**     GSTO\_F\_12012015

**Matrix Type:**   Water

**Lab Sample Name:**     680-119585-1

**Sample Date:**   12/1/2015 2:10:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Aluminum	T	7429-90-5	48000	200	24	ug/L			
Aluminum, Dissolved	D	7429-90-5	50	200	24	ug/L	J	J	
Calcium	T	7440-70-2	510000	5000	250	ug/L			
Calcium, Dissolved	D	7440-70-2	470000	500	25	ug/L			
Iron	T	7439-89-6	170000	50	17	ug/L			
Iron, Dissolved	D	7439-89-6	47	50	17	ug/L	J	J	
Magnesium	T	7439-95-4	26000	5000	330	ug/L			
Magnesium, Dissolved	D	7439-95-4	19000	500	33	ug/L			
Potassium	T	7440-09-7	2600	1000	17	ug/L		J+	Q
Potassium, Dissolved	D	7440-09-7	2300	1000	17	ug/L			
Sodium	T	7440-23-5	4800	10000	4800	ug/L	U	U	
Sodium, Dissolved	D	7440-23-5	4600	1000	480	ug/L			

**Sample Name**     GTSO\_C\_12012015

**Matrix Type:**   Water

**Lab Sample Name:**     680-119585-2

**Sample Date:**   12/1/2015 2:20:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Aluminum	T	7429-90-5	5300	200	24	ug/L			
Aluminum, Dissolved	D	7429-90-5	3100	200	24	ug/L		J	F1
Calcium	T	7440-70-2	430000	500	25	ug/L			
Calcium, Dissolved	D	7440-70-2	430000	500	25	ug/L			
Iron	T	7439-89-6	37000	50	17	ug/L			
Iron, Dissolved	D	7439-89-6	29000	50	17	ug/L			
Magnesium	T	7439-95-4	19000	500	33	ug/L			
Magnesium, Dissolved	D	7439-95-4	19000	500	33	ug/L			
Potassium	T	7440-09-7	2300	1000	17	ug/L	F1	J+	Q
Potassium, Dissolved	D	7440-09-7	2300	1000	17	ug/L			
Sodium	T	7440-23-5	2400	1000	480	ug/L			
Sodium, Dissolved	D	7440-23-5	2700	1000	480	ug/L			

## Analysis Method 200.7 Rev 4.4

Sample Name		GTSO_C_12012015D				Matrix Type: Water			
Lab Sample Name:		680-119585-3		Sample Date:		12/1/2015 2:25:00 PM			
Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Aluminum	T	7429-90-5	4000	200	24	ug/L			
Aluminum, Dissolved	D	7429-90-5	2100	200	24	ug/L		J	F1
Calcium	T	7440-70-2	440000	500	25	ug/L			
Calcium, Dissolved	D	7440-70-2	430000	500	25	ug/L			
Iron	T	7439-89-6	30000	50	17	ug/L			
Iron, Dissolved	D	7439-89-6	23000	50	17	ug/L			
Magnesium	T	7439-95-4	19000	500	33	ug/L			
Magnesium, Dissolved	D	7439-95-4	18000	500	33	ug/L			
Potassium	T	7440-09-7	2300	1000	17	ug/L		J+	Q
Potassium, Dissolved	D	7440-09-7	2200	1000	17	ug/L			
Sodium	T	7440-23-5	2700	1000	480	ug/L			
Sodium, Dissolved	D	7440-23-5	3000	1000	480	ug/L			

Sample Name		A72_12012015				Matrix Type: Water			
Lab Sample Name:		680-119585-4		Sample Date:		12/1/2015 3:45:00 PM			
Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Aluminum	T	7429-90-5	2700	200	24	ug/L			
Aluminum, Dissolved	D	7429-90-5	440	200	24	ug/L			
Calcium	T	7440-70-2	100000	500	25	ug/L			
Calcium, Dissolved	D	7440-70-2	100000	500	25	ug/L			
Iron	T	7439-89-6	6900	50	17	ug/L			
Iron, Dissolved	D	7439-89-6	4200	50	17	ug/L			
Magnesium	T	7439-95-4	6500	500	33	ug/L			
Magnesium, Dissolved	D	7439-95-4	6600	500	33	ug/L			
Potassium	T	7440-09-7	1200	1000	17	ug/L		J+	Q
Potassium, Dissolved	D	7440-09-7	1200	1000	17	ug/L			
Sodium	T	7440-23-5	3600	1000	480	ug/L			
Sodium, Dissolved	D	7440-23-5	3700	1000	480	ug/L			

Sample Name		GKMTW908A_12022015					Matrix Type: Water		
Lab Sample Name:		680-119585-5		Sample Date:		12/2/2015 9:00:00 AM			
Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Aluminum	T	7429-90-5	380	200	24	ug/L			

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Aluminum, Dissolved	D	7429-90-5	220	200	24	ug/L		
Calcium	T	7440-70-2	56000	500	25	ug/L		
Calcium, Dissolved	D	7440-70-2	61000	500	25	ug/L		
Iron	T	7439-89-6	5000	50	17	ug/L		
Iron, Dissolved	D	7439-89-6	5000	50	17	ug/L		
Magnesium	T	7439-95-4	4200	500	33	ug/L		
Magnesium, Dissolved	D	7439-95-4	4600	500	33	ug/L		
Potassium	T	7440-09-7	1000	1000	17	ug/L		
Potassium, Dissolved	D	7440-09-7	990	1000	17	ug/L	J	J
Sodium	T	7440-23-5	2800	1000	480	ug/L		
Sodium, Dissolved	D	7440-23-5	3000	1000	480	ug/L		

## Analysis Method 200.8

**Sample Name** GSTO\_F\_12012015 **Matrix Type:** Water

**Lab Sample Name:** 680-119585-1 **Sample Date:** 12/1/2015 2:10:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Antimony	T	7440-36-0	2.9	1	0.4	ug/L			
Antimony, Dissolved	D	7440-36-0	0.4	1	0.4	ug/L	U	U	
Arsenic	T	7440-38-2	38	1	0.37	ug/L			
Arsenic, Dissolved	D	7440-38-2	0.37	1	0.37	ug/L	U	U	
Barium	T	7440-39-3	12	2	0.14	ug/L			
Barium, Dissolved	D	7440-39-3	7.8	2	0.14	ug/L			
Beryllium	T	7440-41-7	18	0.4	0.15	ug/L			
Beryllium, Dissolved	D	7440-41-7	0.15	0.4	0.15	ug/L	U	U	
Cadmium	T	7440-43-9	96	0.5	0.043	ug/L			
Cadmium, Dissolved	D	7440-43-9	16	0.5	0.043	ug/L			
Chromium	T	7440-47-3	6.3	2	1	ug/L			
Chromium, Dissolved	D	7440-47-3	1	2	1	ug/L	U	U	
Cobalt	T	7440-48-4	150	0.4	0.12	ug/L			
Cobalt, Dissolved	D	7440-48-4	28	0.4	0.12	ug/L			
Copper	T	7440-50-8	9900	1	0.5	ug/L	E		
Copper, Dissolved	D	7440-50-8	6.3	1	0.5	ug/L			
Lead	T	7439-92-1	42	0.3	0.06	ug/L			
Lead, Dissolved	D	7439-92-1	0.06	0.3	0.06	ug/L	U	U	
Manganese	T	7439-96-5	40000	2.5	1.2	ug/L	E		
Manganese, Dissolved	D	7439-96-5	27000	2.5	1.2	ug/L	E		
Molybdenum	T	7439-98-7	5	1	0.45	ug/L			
Molybdenum, Dissolved	D	7439-98-7	1.5	1	0.45	ug/L			
Nickel	T	7440-02-0	84	1	0.4	ug/L			

## Analysis Method 200.8

Nickel, Dissolved	D	7440-02-0	17	1	0.4	ug/L		
Selenium	T	7782-49-2	3.8	2	0.58	ug/L		
Selenium, Dissolved	D	7782-49-2	0.58	2	0.58	ug/L	U	<b>U</b>
Silver	T	7440-22-4	0.1	1	0.1	ug/L	U	<b>U</b>
Silver, Dissolved	D	7440-22-4	0.1	1	0.1	ug/L	U	<b>U</b>
Thallium	T	7440-28-0	0.2	0.2	0.1	ug/L		
Thallium, Dissolved	D	7440-28-0	0.13	0.2	0.1	ug/L	J	<b>J</b>
Vanadium	T	7440-62-2	35	1	0.3	ug/L	B	
Vanadium, Dissolved	D	7440-62-2	0.3	1	0.3	ug/L	U	<b>U</b>
Zinc	T	7440-66-6	33000	20	2.8	ug/L	E	
Zinc, Dissolved	D	7440-66-6	1800	20	2.8	ug/L		

**Sample Name** GTSO\_C\_12012015 **Matrix Type:** Water

**Lab Sample Name:** 680-119585-2 **Sample Date:** 12/1/2015 2:20:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Antimony	T	7440-36-0	0.4	1	0.4	ug/L	J	<b>J</b>	
Antimony, Dissolved	D	7440-36-0	0.4	1	0.4	ug/L	U	<b>U</b>	
Arsenic	T	7440-38-2	2.8	1	0.37	ug/L			
Arsenic, Dissolved	D	7440-38-2	0.37	1	0.37	ug/L	U	<b>U</b>	
Barium	T	7440-39-3	9.7	2	0.14	ug/L			
Barium, Dissolved	D	7440-39-3	9.4	2	0.14	ug/L			
Beryllium	T	7440-41-7	2.7	0.4	0.15	ug/L			
Beryllium, Dissolved	D	7440-41-7	2	0.4	0.15	ug/L			
Cadmium	T	7440-43-9	49	0.5	0.043	ug/L			
Cadmium, Dissolved	D	7440-43-9	47	0.5	0.043	ug/L			
Chromium	T	7440-47-3	1	2	1	ug/L	U	<b>U</b>	
Chromium, Dissolved	D	7440-47-3	1	2	1	ug/L	U	<b>U</b>	
Cobalt	T	7440-48-4	66	0.4	0.12	ug/L			
Cobalt, Dissolved	D	7440-48-4	61	0.4	0.12	ug/L			
Copper	T	7440-50-8	1300	1	0.5	ug/L			
Copper, Dissolved	D	7440-50-8	750	1	0.5	ug/L		<b>J</b>	<b>F1</b>
Lead	T	7439-92-1	2.9	0.3	0.06	ug/L			
Lead, Dissolved	D	7439-92-1	0.27	0.3	0.06	ug/L	J	<b>J</b>	
Manganese	T	7439-96-5	27000	2.5	1.2	ug/L	E		
Manganese, Dissolved	D	7439-96-5	25000	2.5	1.2	ug/L	E		
Molybdenum	T	7439-98-7	1	1	0.45	ug/L			
Molybdenum, Dissolved	D	7439-98-7	0.67	1	0.45	ug/L	J	<b>J</b>	
Nickel	T	7440-02-0	37	1	0.4	ug/L			
Nickel, Dissolved	D	7440-02-0	35	1	0.4	ug/L			
Selenium	T	7782-49-2	0.76	2	0.58	ug/L	J	<b>J</b>	

## Analysis Method 200.8

Selenium, Dissolved	D	7782-49-2	0.66	2	0.58	ug/L	J	J
Silver	T	7440-22-4	0.1	1	0.1	ug/L	U	U
Silver, Dissolved	D	7440-22-4	0.1	1	0.1	ug/L	U	U
Thallium	T	7440-28-0	0.2	0.2	0.1	ug/L		
Thallium, Dissolved	D	7440-28-0	0.18	0.2	0.1	ug/L	J	J
Vanadium	T	7440-62-2	2.2	1	0.3	ug/L	B	
Vanadium, Dissolved	D	7440-62-2	0.3	1	0.3	ug/L	U	U
Zinc	T	7440-66-6	13000	20	2.8	ug/L	E	
Zinc, Dissolved	D	7440-66-6	12000	20	2.8	ug/L	E	

**Sample Name** GTSO\_C\_12012015D

**Matrix Type:** Water

**Lab Sample Name:** 680-119585-3 **Sample Date:** 12/1/2015 2:25:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Antimony	T	7440-36-0	0.4	1	0.4	ug/L	U	U	
Antimony, Dissolved	D	7440-36-0	0.4	1	0.4	ug/L	U	U	
Arsenic	T	7440-38-2	2.3	1	0.37	ug/L			
Arsenic, Dissolved	D	7440-38-2	0.37	1	0.37	ug/L	U	U	
Barium	T	7440-39-3	9.6	2	0.14	ug/L			
Barium, Dissolved	D	7440-39-3	9.1	2	0.14	ug/L			
Beryllium	T	7440-41-7	2.3	0.4	0.15	ug/L			
Beryllium, Dissolved	D	7440-41-7	1.6	0.4	0.15	ug/L			
Cadmium	T	7440-43-9	47	0.5	0.043	ug/L			
Cadmium, Dissolved	D	7440-43-9	44	0.5	0.043	ug/L			
Chromium	T	7440-47-3	1	2	1	ug/L	U	U	
Chromium, Dissolved	D	7440-47-3	1	2	1	ug/L	U	U	
Cobalt	T	7440-48-4	62	0.4	0.12	ug/L			
Cobalt, Dissolved	D	7440-48-4	57	0.4	0.12	ug/L			
Copper	T	7440-50-8	970	1	0.5	ug/L			
Copper, Dissolved	D	7440-50-8	430	1	0.5	ug/L		J	F1
Lead	T	7439-92-1	2.3	0.3	0.06	ug/L			
Lead, Dissolved	D	7439-92-1	0.06	0.3	0.06	ug/L	U	U	
Manganese	T	7439-96-5	26000	2.5	1.2	ug/L	E		
Manganese, Dissolved	D	7439-96-5	24000	2.5	1.2	ug/L	E		
Molybdenum	T	7439-98-7	1	1	0.45	ug/L			
Molybdenum, Dissolved	D	7439-98-7	0.69	1	0.45	ug/L	J	J	
Nickel	T	7440-02-0	36	1	0.4	ug/L			
Nickel, Dissolved	D	7440-02-0	33	1	0.4	ug/L			
Selenium	T	7782-49-2	0.69	2	0.58	ug/L	J	J	
Selenium, Dissolved	D	7782-49-2	0.59	2	0.58	ug/L	J	J	
Silver	T	7440-22-4	0.1	1	0.1	ug/L	U	U	

## Analysis Method 200.8

Silver, Dissolved	D	7440-22-4	0.1	1	0.1	ug/L	U	<b>U</b>	
Thallium	T	7440-28-0	0.19	0.2	0.1	ug/L	J	<b>J</b>	
Thallium, Dissolved	D	7440-28-0	0.18	0.2	0.1	ug/L	J	<b>J</b>	
Vanadium	T	7440-62-2	1.7	1	0.3	ug/L	B	<b>J+</b>	<b>B</b>
Vanadium, Dissolved	D	7440-62-2	0.3	1	0.3	ug/L	U	<b>U</b>	
Zinc	T	7440-66-6	12000	20	2.8	ug/L	E		
Zinc, Dissolved	D	7440-66-6	11000	20	2.8	ug/L	E		

**Sample Name** A72\_12012015 **Matrix Type:** Water

**Lab Sample Name:** 680-119585-4 **Sample Date:** 12/1/2015 3:45:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Antimony	T	7440-36-0	0.4	1	0.4	ug/L	U	<b>U</b>	
Antimony, Dissolved	D	7440-36-0	0.4	1	0.4	ug/L	U	<b>U</b>	
Arsenic	T	7440-38-2	1.6	1	0.37	ug/L			
Arsenic, Dissolved	D	7440-38-2	0.37	1	0.37	ug/L	J	<b>J</b>	
Barium	T	7440-39-3	23	2	0.14	ug/L			
Barium, Dissolved	D	7440-39-3	21	2	0.14	ug/L			
Beryllium	T	7440-41-7	0.47	0.4	0.15	ug/L			
Beryllium, Dissolved	D	7440-41-7	0.22	0.4	0.15	ug/L	J	<b>J</b>	
Cadmium	T	7440-43-9	2.2	0.5	0.043	ug/L			
Cadmium, Dissolved	D	7440-43-9	2	0.5	0.043	ug/L			
Chromium	T	7440-47-3	1	2	1	ug/L	U	<b>U</b>	
Chromium, Dissolved	D	7440-47-3	1	2	1	ug/L	U	<b>U</b>	
Cobalt	T	7440-48-4	9	0.4	0.12	ug/L			
Cobalt, Dissolved	D	7440-48-4	8.8	0.4	0.12	ug/L			
Copper	T	7440-50-8	43	1	0.5	ug/L			
Copper, Dissolved	D	7440-50-8	19	1	0.5	ug/L			
Lead	T	7439-92-1	11	0.3	0.06	ug/L			
Lead, Dissolved	D	7439-92-1	0.54	0.3	0.06	ug/L			
Manganese	T	7439-96-5	1800	2.5	1.2	ug/L			
Manganese, Dissolved	D	7439-96-5	1700	2.5	1.2	ug/L			
Molybdenum	T	7439-98-7	1	1	0.45	ug/L			
Molybdenum, Dissolved	D	7439-98-7	0.53	1	0.45	ug/L	J	<b>J</b>	
Nickel	T	7440-02-0	6.5	1	0.4	ug/L			
Nickel, Dissolved	D	7440-02-0	6	1	0.4	ug/L			
Selenium	T	7782-49-2	0.61	2	0.58	ug/L	J	<b>J</b>	
Selenium, Dissolved	D	7782-49-2	0.58	2	0.58	ug/L	U	<b>U</b>	
Silver	T	7440-22-4	0.1	1	0.1	ug/L	U	<b>U</b>	
Silver, Dissolved	D	7440-22-4	0.1	1	0.1	ug/L	U	<b>U</b>	
Thallium	T	7440-28-0	0.1	0.2	0.1	ug/L	U	<b>U</b>	

## Analysis Method 200.8

Thallium, Dissolved	D	7440-28-0	0.1	0.2	0.1	ug/L	U	<b>U</b>	
Vanadium	T	7440-62-2	1.6	1	0.3	ug/L	B	<b>J+</b>	<b>B</b>
Vanadium, Dissolved	D	7440-62-2	0.3	1	0.3	ug/L	U	<b>U</b>	
Zinc	T	7440-66-6	740	20	2.8	ug/L			
Zinc, Dissolved	D	7440-66-6	670	20	2.8	ug/L			

**Sample Name** GKMTW908A\_12022015

**Matrix Type:** Water

**Lab Sample Name:** 680-119585-5 **Sample Date:** 12/2/2015 9:00:00 AM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Antimony	T	7440-36-0	0.4	1	0.4	ug/L	U	<b>U</b>	
Antimony, Dissolved	D	7440-36-0	0.4	1	0.4	ug/L	U	<b>U</b>	
Arsenic	T	7440-38-2	0.37	1	0.37	ug/L	U	<b>U</b>	
Arsenic, Dissolved	D	7440-38-2	0.37	1	0.37	ug/L	U	<b>U</b>	
Barium	T	7440-39-3	20	2	0.14	ug/L			
Barium, Dissolved	D	7440-39-3	23	2	0.14	ug/L			
Beryllium	T	7440-41-7	0.15	0.4	0.15	ug/L	U	<b>U</b>	
Beryllium, Dissolved	D	7440-41-7	0.15	0.4	0.15	ug/L	U	<b>U</b>	
Cadmium	T	7440-43-9	0.21	0.5	0.043	ug/L	J	<b>J</b>	
Cadmium, Dissolved	D	7440-43-9	0.065	0.5	0.043	ug/L	J	<b>J</b>	
Chromium	T	7440-47-3	1	2	1	ug/L	U	<b>U</b>	
Chromium, Dissolved	D	7440-47-3	1	2	1	ug/L	U	<b>U</b>	
Cobalt	T	7440-48-4	1.3	0.4	0.12	ug/L			
Cobalt, Dissolved	D	7440-48-4	1.7	0.4	0.12	ug/L			
Copper	T	7440-50-8	49	1	0.5	ug/L			
Copper, Dissolved	D	7440-50-8	0.5	1	0.5	ug/L	U	<b>U</b>	
Lead	T	7439-92-1	23	0.3	0.06	ug/L			
Lead, Dissolved	D	7439-92-1	0.096	0.3	0.06	ug/L	J	<b>J</b>	
Manganese	T	7439-96-5	240	2.5	1.2	ug/L			
Manganese, Dissolved	D	7439-96-5	270	2.5	1.2	ug/L			
Molybdenum	T	7439-98-7	0.45	1	0.45	ug/L	U	<b>U</b>	
Molybdenum, Dissolved	D	7439-98-7	0.45	1	0.45	ug/L	U	<b>U</b>	
Nickel	T	7440-02-0	2.6	1	0.4	ug/L			
Nickel, Dissolved	D	7440-02-0	2.5	1	0.4	ug/L			
Selenium	T	7782-49-2	0.58	2	0.58	ug/L	U	<b>U</b>	
Selenium, Dissolved	D	7782-49-2	0.58	2	0.58	ug/L	U	<b>U</b>	
Silver	T	7440-22-4	0.1	1	0.1	ug/L	U	<b>U</b>	
Silver, Dissolved	D	7440-22-4	0.1	1	0.1	ug/L	U	<b>U</b>	
Thallium	T	7440-28-0	0.1	0.2	0.1	ug/L	U	<b>U</b>	
Thallium, Dissolved	D	7440-28-0	0.1	0.2	0.1	ug/L	U	<b>U</b>	
Vanadium	T	7440-62-2	0.3	1	0.3	ug/L	U	<b>U</b>	

## Analysis Method 200.8

Vanadium, Dissolved D		7440-62-2	0.3	1	0.3	ug/L	U	<b>U</b>	
Zinc	T	7440-66-6	69	20	2.8	ug/L			
Zinc, Dissolved	D	7440-66-6	130	20	2.8	ug/L			

## Analysis Method 2320B-2011

<b>Sample Name</b>	GSTO_F_12012015					<b>Matrix Type:</b>	Water		
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**Lab Sample Name:** 680-119585-1 **Sample Date:** 12/1/2015 2:10:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Alkalinity	T	STL00171	7.7	5	5	mg/L			

<b>Sample Name</b>	GTSO_C_12012015					<b>Matrix Type:</b>	Water		
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**Lab Sample Name:** 680-119585-2 **Sample Date:** 12/1/2015 2:20:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Alkalinity	T	STL00171	5	5	5	mg/L	U	<b>U</b>	

<b>Sample Name</b>	GTSO_C_12012015D					<b>Matrix Type:</b>	Water		
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**Lab Sample Name:** 680-119585-3 **Sample Date:** 12/1/2015 2:25:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Alkalinity	T	STL00171	5	5	5	mg/L	U	<b>U</b>	

<b>Sample Name</b>	A72_12012015					<b>Matrix Type:</b>	Water		
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**Lab Sample Name:** 680-119585-4 **Sample Date:** 12/1/2015 3:45:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Alkalinity	T	STL00171	160	5	5	mg/L			

<b>Sample Name</b>	GKMTW908A_12022015					<b>Matrix Type:</b>	Water		
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**Lab Sample Name:** 680-119585-5 **Sample Date:** 12/2/2015 9:00:00 AM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Alkalinity	T	STL00171	34	5	5	mg/L			

## Analysis Method 300.0

<b>Sample Name</b>	GSTO_F_12012015					<b>Matrix Type:</b>	Water		
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**Lab Sample Name:** 680-119585-1 **Sample Date:** 12/1/2015 2:10:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chloride	T	16887-00-6	0.51	1	0.4	mg/L	J	<b>J</b>	
Fluoride	T	16984-48-8	4.9	0.2	0.08	mg/L			
Nitrate as N	T	14797-55-8	0.046	0.1	0.046	mg/L	U	<b>U</b>	

## Analysis Method 300.0

Sulfate	T	14808-79-8	1200	50	20	mg/L			
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**Sample Name** GTSO\_C\_12012015

**Matrix Type:** Water

**Lab Sample Name:** 680-119585-2 **Sample Date:** 12/1/2015 2:20:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chloride	T	16887-00-6	0.52	1	0.4	mg/L	J	J	
Fluoride	T	16984-48-8	5.7	0.2	0.08	mg/L			
Nitrate as N	T	14797-55-8	0.046	0.1	0.046	mg/L	U	U	
Sulfate	T	14808-79-8	1200	50	20	mg/L			

**Sample Name** GTSO\_C\_12012015D

**Matrix Type:** Water

**Lab Sample Name:** 680-119585-3 **Sample Date:** 12/1/2015 2:25:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chloride	T	16887-00-6	0.5	1	0.4	mg/L	J	J	
Fluoride	T	16984-48-8	4.9	0.2	0.08	mg/L			
Nitrate as N	T	14797-55-8	0.046	0.1	0.046	mg/L	U	U	
Sulfate	T	14808-79-8	1200	50	20	mg/L			

**Sample Name** A72\_12012015

**Matrix Type:** Water

**Lab Sample Name:** 680-119585-4 **Sample Date:** 12/1/2015 3:45:00 PM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chloride	T	16887-00-6	1.4	0.5	0.2	mg/L			
Fluoride	T	16984-48-8	0.86	0.1	0.04	mg/L			
Nitrate as N	T	14797-55-8	0.084	0.05	0.023	mg/L			
Sulfate	T	14808-79-8	280	10	4	mg/L			

**Sample Name** GKMTW908A\_12022015

**Matrix Type:** Water

**Lab Sample Name:** 680-119585-5 **Sample Date:** 12/2/2015 9:00:00 AM

Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
Chloride	T	16887-00-6	0.36	0.5	0.2	mg/L	J	J	
Fluoride	T	16984-48-8	0.26	0.1	0.04	mg/L			
Nitrate as N	T	14797-55-8	0.068	0.05	0.023	mg/L			
Sulfate	T	14808-79-8	140	5	2	mg/L			

## Analysis Method 4500 H+ B-2011

Sample Name		GSTO_F_12012015				Matrix Type: Water			
Lab Sample Name:		680-119585-1	Sample Date:		12/1/2015 2:10:00 PM				
Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
pH	T	STL00204	7.03			SU	HF	J+	H, L
Sample Name		GTSO_C_12012015				Matrix Type: Water			
Lab Sample Name:		680-119585-2	Sample Date:		12/1/2015 2:20:00 PM				
Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
pH	T	STL00204	4.86			SU	HF	J+	H, L
Sample Name		GTSO_C_12012015D				Matrix Type: Water			
Lab Sample Name:		680-119585-3	Sample Date:		12/1/2015 2:25:00 PM				
Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
pH	T	STL00204	4.82			SU	HF	J+	H, L
Sample Name		A72_12012015				Matrix Type: Water			
Lab Sample Name:		680-119585-4	Sample Date:		12/1/2015 3:45:00 PM				
Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
pH	T	STL00204	5.61			SU	HF	J+	H, L
Sample Name		GKMTW908A_12022015				Matrix Type: Water			
Lab Sample Name:		680-119585-5	Sample Date:		12/2/2015 9:00:00 AM				
Analyte	Total/Dissolved	CAS No	Result Value	Reporting Limit	MDL	Result Units	Lab Qualifier	Validation Qualifier	Validation Notes
pH	T	STL00204	5.77			SU	HF	J+	H, L